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United States Patent and Trademark Office  
Attn: **Examiner Raj Guru**  
Facsimile: (703)872-9711

Re: USSN 09/866,451  
Applicants: Khan *et al.*  
METHOD OF MODIFYING COMPONENTS PRESENT IN CASHEW NUT  
SHELL LIQUID

Dear Examiner Guru:

As you had requested, a copy of the International Preliminary Examination Report received in the parent PCT application for the above-captioned U.S. continuation application is transmitted herewith.

Would you please acknowledge receipt of this facsimile by returning a facsimile copy of this cover sheet to (518)452-5600. Thank you.

Respectfully,

Date: May 10, 2002

Candice J. Clement  
Candice J. Clement, Esq.  
Attorney for Applicants  
USPTO Registration Number 39,946  
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7 page attachment

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## PATENT COOPERATION TREATY

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19. 03. 2001

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

15

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BB1427		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB99/03913	International filing date (day/month/year) 25/11/1999	Priority date (day/month/year) 25/11/1998	
International Patent Classification (IPC) or national classification and IPC C07C65/30			
Applicant E.I. DU PONT DE NEMOURS AND COMPANY et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"><li>I <input checked="" type="checkbox"/> Basis of the report</li><li>II <input type="checkbox"/> Priority</li><li>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li><li>IV <input checked="" type="checkbox"/> Lack of unity of invention</li><li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li><li>VI <input type="checkbox"/> Certain documents cited</li><li>VII <input checked="" type="checkbox"/> Certain defects in the international application</li><li>VIII <input checked="" type="checkbox"/> Certain observations on the international application</li></ul>			
Date of submission of the demand 29/05/2000		Date of completion of this report 31.01.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80285 Munich Tel: +49 89 2399-0 Fax: +49 89 2399-4465		Authorized officer Mercery, J Telephone No. +49 89 2399 8958 	

Form PCT/PEA/409 (cover sheet) (January 1994)

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03913

### 1. Basis of the report

1. This report has been drawn on the basis of (substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17)).

Description, pages:

1-10 as originally filed

Claims, No.:

1-21 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

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**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/03913

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:  
see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes:	Claims	1-8, 10-21
	No:	Claims	9
Inventive step (IS)	Yes:	Claims	1-8
	No:	Claims	10-21
Industrial applicability (IA)	Yes:	Claims	1-21
	No:	Claims	

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**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/03913

2. Citations and explanations  
see separate sheet

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
see separate sheet

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
see separate sheet

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**INTERNATIONAL PRELIMINARY**

International application No. PCT/GB99/03913

**EXAMINATION REPORT - SEPARATE SHEET**

**Re Item IV**

**Lack of unity of invention**

The subject-matter of independent Claim 9 is already known (cf. item V below). The requisite unity of invention (Rule 13.1 PCT) therefore no longer exists inasmuch as a technical relationship involving one or more of the same or corresponding special technical features in the sense of Rule 13.2 PCT does not exist between the subject-matter of Claims 1-8 and Claims 9-21.

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

D1 : J. Food Sci., 1989, 54(6), 1472-4

D2 : JP45026750B

D3 : Chem. Pharm. Bull., 1987, 35(7), 3016-20

**NOVELTY (Article 33(2) PCT)**

**CLAIM 9**

The subject-matter of Claim 9 is not novel, since mixtures of alkyl aldehydes are known (cf. for example D1). The wording "formed by the ozonolysis of CNSL and subsequent reduction of the resulting ozonolysis products" should be read as "obtainable by...". The aldehydes in the headspace mixture of heated pork fat of D1 e.g. formaldehyde, malonaldehyde, butanal, octanal etc. are also obtainable from cashew nut shell liquid (CNSL). A product is not rendered novel merely because it is produced by means of a novel process. Claims for products defined in terms of a process of manufacture are novel and inventive only if the products as such are novel and inventive.

**CLAIMS 1-8**

In the light of D2, which teaches that condensates useful as adhesives are prepared by heating an acid obtained by solvent extraction of cashew nut shells with boric acid, the problem to be solved by the present invention may be regarded as the provision of an alternative process for the preparation of adhesives.

The solution provided by Claim 1 comprises subjecting CNSL to ozonolysis, followed by reduction of the ozonolysis reaction products to give a mixture of phenolic components and aldehydes. These CNSL aldehydes may then be

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**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03913

treated with an acidic material in the presence of water to form an emulsion, and thereafter further treated with base, or they may be heated with a particulate or fibrous material to form a composite.

The process of Claim 1 is novel, since although D3 teaches the ozonolysis and reduction of anarcadic acid and cardanol respectively, both of which are components of CNSL, none of the cited art teaches the ozonolysis and reduction of a mixture corresponding to CNSL.

**CLAIMS 10-21**

As far as can be ascertained (cf. item VIII below), the methods of Claims 11 and 16 are not disclosed in the cited art, nor are adhesive compositions according to Claim 11.

**INVENTIVE STEP (Article 33(3) PCT)**

**CLAIMS 1-8**

The process of Claim 1 is inventive, since none of the cited art suggests treating CNSL in such a manner to obtain a product which may then be used to make adhesive compositions. In D3, the compounds anarcadic acid and cardanol are obtained by extraction from *Ginkgo biloba*, the subsequent ozonolysis and reduction being performed merely as part of a structure determination.

**CLAIMS 10-21**

In view of the lack of clarity of Claims 10-21 (cf. item VIII below), it is unclear whether any technical problem has actually been solved by the methods and composition of independent Claims 10, 11 and 16, and thus an inventive step cannot be acknowledged.

**Re Item VII**

**Certain defects in the international application**

- 1) In independent Claims 1, 9, 10, 16 and 19, the abbreviation "CNSL" should have been supplemented by "cashew nut shell liquid".
- 2) Claims 2 and 6 comprise all the features of Claim 1 and are therefore not appropriately formulated as claims dependent on the latter (Rule 6.4 PCT). Furthermore, the subject-matter of these claims appears to be identical to that of Claims 1 and 5 respectively, the only difference being the fact that the product mixtures obtained are additionally defined. However, either said product mixtures are inevitably obtained as a result of the reactions defined, in which case the

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**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03913

claims are superfluous and should have been deleted, or, the reaction conditions necessary for achieving said product mixtures should have been included in the claims.

- 3) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D2 is not mentioned in the description, nor is this document identified therein.

**Re Item VIII**

**Certain observations on the international application**

- 1) The subject-matter of Claims 9-21 is unclear (Article 6 PCT), since it is not possible to determine the scope of these claims, as CNSL, as stated by the Applicant on page 1, lines 12-23 of the description, is "a mixture of phenolic compounds and the compounds which can be present in varying proportions include anacardic acid, cardanol, cardol and 2-methyl cardol" (emphasis added). Thus since the composition of CNSL is not a fixed one, the compounds present therein and the amounts thereof apparently both being variables, it is not possible to determine whether a specific mixture of aldehydes is obtainable from CNSL or not. The subject-matter of Claim 11 is in addition unclear, since no details are given as to how the adhesive composition is formed from said aldehydes, Claim 11 embracing the product of any number of chemical modifications of an insufficiently defined starting aldehyde mixture.